

C. Remarks

Claims 1-6 are pending in the subject application, of which claims 1 and 6 are in independent form. Claims 2 and 7 have been cancelled without prejudice or disclaimer. The independent claims have been amended to better define the present invention. Support for this amendment may be found, for example, in claim 2 and in the specification at page 4, lines 12-15, and page 7, line 27, to page 8, line 6. No new matter has been added. Reconsideration of the present claims is expressly requested.

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious from WO 02/33709 (Ito) and WO 03/041091 (Nomura) in view of WO 2005/001037 (Li). The grounds of rejection are respectfully traversed.

Prior to addressing the merits of rejection, Applicants would like to briefly discuss some of the features and advantages of the presently claimed invention. That invention, in pertinent part, is related to an electrolyte membrane comprising a siloxane-based polymer and a method for its production. Specifically, in accordance with the present invention, two-stage polymerization is carried out. In the first stage, a silane compound having a (meth)acrylate functional group and a methylalkoxysilane are subjected to hydrolysis-polymerization to obtain a siloxane polymer having a (meth)acrylate functional group. Then, in the second stage, this siloxane polymer and a methacrylate compound having a phosphate group are subjected to vinyl polymerization to obtain a siloxane-based polymer. The product of the two-stage polymerization is formed into a membrane. Subsequently, the siloxane-based polymer that constitutes the membrane is crosslinked.

The electrolyte membrane produced by this two-stage polymerization and the crosslinking has good water and methanol resistance due to the efficient progress of the polymerization. In particular, the addition of a methylalkoxysilane in the first stage of the two-stage polymerization contributes to a favorable alignment of silane molecules due to

easy association of hydrophobic methyl groups, which, in turn, contributes to a smooth progress of the subsequent vinyl polymerization.

Ito discloses an acrylic polymer containing a phosphate group as an electrolyte. However, Applicants respectfully submit that Ito does not disclose or suggest a siloxane-based polymer that is obtained by vinyl polymerization of a hydrolysis product of a silane compound having a (meth)acrylate functional group and a methylalkoxysilane, followed by siloxane crosslinking, as presently claimed.

Nomura cannot cure the deficiencies of Ito. Nomura discloses a siloxane-based polymer electrolyte membrane containing siloxane crosslinking, but the electrolyte membrane does not have a portion formed by the above-mentioned vinyl polymerization, which is followed by siloxane crosslinking.

Li fails to supplement Ito and Nomura for at least the same reasons. Li, at most, discloses grafting a thermoplastic polymer with some classes of silane compounds. These silane compounds are directly modified with a conductive component, such as H_3PO_4 . Thus, the polymer structure in Li is completely different from the polymer structure of the present invention, and there is no disclosure or suggestion of the siloxane crosslinking of components as recited in the present claims.

Accordingly, Applicants respectfully submit that the cited documents, whether considered separately or in any combination, do not disclose or suggest all of the presently claimed elements.

Wherefore, withdrawal of the outstanding rejections and passage of the application to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,

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